

Proposal Reviews

#208: Restoration of Sacramento Perch to San Francisco Estuary

University of California, Davis

Initial Selection Panel Review

Research and Restoration Technical Panel Review

Bay Regional Review

Delta Regional Review #1
#2

Sacramento Regional Review

#1
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External Scientific Review #3
#4

Prior Performance/Next Phase Funding #1
#2

Environmental Compliance

Budget

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP Initial Selection Panel Review

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)

Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	X
In Part	-
With Conditions	-
Consider as Directed Action	-
Not Recommended	-

Amount: **\$572,732**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

This proposal received outstanding support from previous reviewers. This Panel notes that some comments, particularly referencing the genetics, need to be addressed as the applicants refine their experimental design. Nevertheless, this proposal identifies the appropriate first steps to investigate the feasibility of reintroducing the Sacramento perch (SP) to the Delta.

Even if a reintroduction effort ultimately fails, this research will answer some basic questions concerning SP biology, and may help answer the question of why the species was extirpated from the Delta.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP Research and Restoration Technical Panel Review Form

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;

Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;

Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;

Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	This is a quality proposal with relevance to CalFed goals. The project has a high probability of generating some useful basic biological information for SP. There were some minor administrative difficulties with UCD noted by CalFed. The reviewer and the panel raised questions about the adequacy of the approach for ultimately meeting the needs of a restoration effort and concerns about the focus of the genetic analysis. These drawbacks ranked it as above average.
XAbove average	
-Adequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

The consensus of reviewers was that the goals and objectives were clearly stated. This was a well-written proposal. The principal goal is clearly stated as: develop re-introduction strategies for restoring self-sustaining populations of Sacramento perch. Given their extirpation from the San Francisco estuary and the desire by managers to reintroduce this species at some point the proposal offers to develop a basic understanding of SP ecology, genetics and physiology as a basis for understanding what it will take to reintroduce it. The proposal presented a clear justification and conceptual model for the project.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

The consensus among reviewers is that the project team is highly capable and qualified to conduct this research project. For this and most of the other research proposal the performance measures and the products are the same and do not necessarily serve to measures of performance. There is a high probability that this investigation will provide a better biological basis for understanding SP biology and that in turn might serve as a basis for developing a reintroduction strategy. In spite of generally high ranking by reviewers there were several problems raised concerning this proposal. The proposed research approach was not completely justified over a more conservative pilot study. The project as proposed may not hit upon all the necessary information that will be required to assure a successful reintroduction strategy can be implemented since the reason for the initial extirpation is unknown and the factors responsible for the extirpation may still be in force within this troubled ecosystem. Finally it was not clear to reviewers how the basic biological information generated by the research will lead to a sound restoration strategy.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

There is little doubt that the project will advance the state of knowledge with regard to basic biology, genetics and physiology of SP. If the appropriate insights are gained from the proposed research products should be produced that are useful to managers. At a minimum the proposed white paper should be undertaken as a starting point if the entire project isnt selected for funding.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The reviews were mixed with regard to the budget. Some felt it was reasonable for a multi-investigator effort, one felt that at least the genetic analyses were overpriced and one felt that the budget was low and that the time frame too short to accomplish the project. There also appeared to be some errors in the budget. Budget totals dont match and there may be errors in the benefits section in year 1. The consensus was that some form of this project should be undertaken and that perhaps a three year project make more sense to make the appropriate progress in a reasonable timeframe.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

There was strong support for this research as a high priority for ERP among the various regional panels (3 of 4 H, 1 M priority). It was generally felt that the project would provide meaningful results because of the competence of the investigative team and because this particular species might serve as a model for restoration strategies for other species within the region. The regional advisors also cited the proposed link to other restoration efforts underway as very positive (i.e. Cosumnes River floodplain; McCormack Williamson Tract).

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

Some problems related to the UCD administration with regard to their past project administration were expressed. These are unrelated to the project investigators.

Miscellaneous comments:

None

Bay Regional Review:

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Overall Ranking: -Low **XMedium** -High

Provide a brief summary explanation of the committee's ranking:

The panel supports research, like this, that delivers scientific information which improves understanding about key ecosystem processes in the Bay + Suisun Marsh or about species and habitats which are insufficiently understood. The project is important for SF Bay but is even more important to SJ/SR and delta regions.

1. Is the project feasible based on local constraints?

XYes -No

How?

Focus on gathering info for re-introduction. Very experienced team with excellent CalFed track record.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

XYes -No

How?

SP (at risk spp) and info needs across multiple CalFed regions (MR-6). Most early life history info unknown for this spp.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

XYes -No

How?

Provides planning efforts for re-introduction. Creates linkages based on findings.

4. Does the project adequately involve local people and institutions?

XYes -No

How?

Somewhat - could have better linkages to mgt agencies where SP natural populations exist.

Other Comments:

Why not study SP early life history & phys in areas where SP is naturally occurring (as opposed to Lagoon Valley)?

Phys: velocity info - using data from field studies on flow rates or is it approximated for the lab study?

Delta Regional Review: #1

Proposal Number: 208

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Overall Ranking: -Low -Medium **XHigh**

Provide a brief summary explanation of the committee's ranking:

The Delta is the natural habitat for Sacramento perch, an "at-risk" species about which little is known. The actual investigation and development of restoration strategies especially appealed to the regional panel.

1. Is the project feasible based on local constraints?

XYes -No

How?

Potential restoration sites are local and appropriate.

Lagoon Valley Reservoir, where field work on an existing population of Sacramento perch is to be conducted, is close (i.e., about 30-35 miles) to UC-Davis; travel time will be minimal.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

XYes -No

How?

From the Restoration Priorities for the Delta and Eastside Tributaries Region:

"4. Restore habitat that would specifically benefit one or more at-risk species; improve knowledge of optimal restoration strategies for these species.

- **Adaptive experimentation with species-specific restoration approaches. Adaptive management restoration experiments that test the effectiveness of alternative restoration strategies for one or more at-risk fish, bird, or riparian species (or communities that include these species) in the Delta or eastside tributaries are a priority. Investigations and monitoring efforts are also a priority to better understand existing Delta restoration environments or newly designed restoration experiments (Strategic Goal 4, habitat)**

- **Life histories and restoration or habitat requirements of at-risk species. Workshops, white papers, or pilot scale monitoring and survey programs that might summarize or better the state of knowledge about poorly known riparian or wetland species or groups of species that inhabit the Delta, especially where such studies can lead to population models (Strategic Goal 1, at-risk species assessments)."**

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

XYes -No

How?

As one possible restoration strategy, the applicants intend to "develop populations in floodplain ponds that will become distributed into natural environments during periods of flooding. They suggest that "this strategy would be compatible with our on-going studies of restoration of flooded habitat on the McCormick-Williamson Tract (CALFED project #99-B193) and the Cosumnes River Floodplain (CALFED Project #99-N06)."

4. Does the project adequately involve local people and institutions?

XYes -No

How?

The applicants are researchers at UC-Davis. They indicate that they will "be consulting with Christopher Miller, Contra Costa MAD, who is developing artificial rearing techniques for Sacramento perch, for potential use in mosquito control."

Other Comments:

Delta restoration in general may be strongly linked to Sacrameto perch restoration.

Delta Regional Review: #2

Proposal Number: 208

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Overall Ranking: -Low -Medium **X**High

Provide a brief summary explanation of the committee's ranking:

X

1. Is the project feasible based on local constraints?

XYes -No

How?

o This proposal will develop information on whether it is feasible to restore Sacramento perch to Central Valley habitat formerly occupied by the species. It is not known whether restoration can be reasonably accomplished. The data developed in this project will be used to define the biology of the species.

o Three scientists will each be responsible developing key information that will be used to determine the feasibility of restoring Sacramento perch - Dr. Moyle will develop ecology and life history information, Dr. Cech will develop environmental tolerance information and Dr. May will develop genetic information. These scientists are expert in their field and each have competent technical support staff who will be involved in this project.

o Sacramento perch will be sampled in the field at Lagoon Valley Reservoir near Vacaville for early life history documentation. This reservoir supports a population of introduced Sacramento perch. The environmental tolerance and genetics work will be performed in laboratories.

o No CEQA or NEPA documents will be required to complete the proposal. o Data set will be generated and the results of the research will be published in white -paper format, final reports and peer-reviewed scientific journal publications.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

XYes -No

How?

o Sacramento perch is listed by the Department of Fish and Game as a species of special concern, and CALFED classifies the species as At-Risk, Priority 2 . This proposal is consistent with ERP Strategic Goal 1, Objective 2, which addresses at-risk species. (The proposal suggests that Sacramento perch would be a listed species under endangered species legislation if the species had not been distributed to habitats outside its natural range.) o The proposal is consistent with ERP Draft Stage 1 Delta and Eastside Tributaries Region

restoration priorities #4, 6 and 7, and Multi-Region Restoration Priority #6.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

XYes -No

How?

o The absence of Sacramento perch from the Central Valley precludes work on the species elsewhere in the Central Valley watershed (exception is Alameda Creek, one of two habitats in California that support a remnant native population of Sacramento perch).

o Strategies and conditions associated with Sacramento perch restoration should benefit other species and could be incorporated into future restoration projects.

o The data developed in this project will be available to users on request.

4. Does the project adequately involve local people and institutions?

XYes -No

How?

o The proposal indicates that the personnel, equipment and facilities involved in this project are centered at UC Davis.

o The proposal does not address local involvement issues. No public outreach program is identified. There is no indication of public and/or stakeholder sentiments on the proposal, or whether any attempts were made or will be made to solicit such sentiment.

o Christopher Miller, Contra Costa Mosquito Abatement District, will be contacted regarding his work on artificial rearing of Sacramento perch.

o The proposal indicates that collaboration with the city of Vacaville Department of Parks and Recreation and with resource agencies will be arranged.

Other Comments:

X

Sacramento Regional Review:

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Overall Ranking: -Low -Medium **XHigh**

Provide a brief summary explanation of the committee's ranking:

The panel believes this is an important study on at risk native species that should be conducted. The proponents are well qualified to carry out this project.

1. Is the project feasible based on local constraints?

XYes -No

How?

The proponents have the technical expertise and infrastructure to conduct this study. It is an important study that concerns native species of special concern.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

XYes -No

How?

The proposal addresses priorities listed in the PSP under MR1, Strategic Goals 1 & 6.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

XYes -No

How?

The project's efforts for recovery of Sacramento Perch would link to information useful for other native aquatic species.

4. Does the project adequately involve local people and institutions?

-Yes **X**No

How?

This targeted research does not involve local people and institutions other than facilities used for the project. The information gathered from this study will be written in a white paper, IEP newsletter, scientific meetings and journals. The proponents intend to arrange collaboration with Vacaville Department of Parks and Recreation and resource agencies.

Other Comments:

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **208**

Applicant Organization: **University of California, Davis**

Proposal Title: **Restoration of Sacramento Perch to San Francisco Estuary**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
X Excellent	Excellent-proposal subject has merit and interest to CALFED goals.
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

The goals are clearly stated and internally consistent. The proposal is well written and gets to the point without a lot of arm waving. SP were extirpated and it is listed as a species that managers would like to restore to its native range.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

A clear conceptual model is outlined in a figure and in the text. The selection of a research project is justified because of the present status of knowledge regarding the extirpation of SP and the potential to restore this species.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

These researchers outline a very reasonable and well-conceived approach to this problem. The project will generate basic biological information on ELH, physiology and genetics that should prove useful to managers. Because so little is known with regard to the information required to assess the feasibility of restoring SP to its native range, some basic research seems justified. The one fly in the ointment for this proposal is that if they dont know what caused the extirpation to begin with they can only guess whether restoration efforts are likely to be effective in the long-term. Moyles idea of using floodplain ponds as seed ground for areas of the Delta with suitable habitat may be a good one. It would provide a highly suitable habitat for a reestablished population and then let nature do the rest. A potentially cost effect way to restore a species.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

All the proposed research is technically feasible and adequately documented. Given the experience of this team successful completion of the project seems likely. The scale of the project is reasonable.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

Performance measures are listed in the proposal.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

The typical products for a research project are listed. Publication, reports, newsletter. In this case the white paper will be an important and tangible first product.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

This team has the background and expertise to conduct this research. Each has expertise in the section of this work they propose to cover.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The budget seems reasonable for three senior PIs undertaking a 2 year project. The amounts under benefits on the budget form dont match the estimates in the justification for task 2. In fact Im sure the numbers for benefits must be wrong.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **208**

Applicant Organization: **University of California, Davis**

Proposal Title: **Restoration of Sacramento Perch to San Francisco Estuary**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
X Excellent	This proposal hits all the right marks for important objectives.
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

I found the goals, objectives and hypotheses to be understandable, logical, and consistent. The proposal calls for a strategic approach to the reintroduction of Sacramento perch to its native habitat, and is timely in that the species persists in only a few native populations and various introduced populations in novel habitats. This study proposes to glean information from these various populations and environments to learn where and how the species might best be recolonized. These options might be lost with time.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The study appears justified from current available knowledge. While the distribution and relative abundance of the Sacramento perch appears reasonably defined, their basic biology, ecology, and population dynamics are not. The conceptual model put forth, while simple in approach, appears strategic, comprehensive, and practical. Exotic species were likely a primary cause of local extinction for Sacramento perch, however, environmental degradation was likely to also be a limiting factor throughout much of its native range. Water quality in many native habitats has improved over the last few decades, opening the possibility for self-sustaining populations. This work focuses on pilot projects in habitats free of exotic competitors and predators, and seeks to implement a step-wise approach to developing a successful reintroduction methodology. The initial objective of a summary of existing information is clearly a needed first step, subsequent tasks appear to be designed to build one upon the other.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

The approach does appear to be integrated and designed to fill the critical information gaps. Each of the outlined objectives will generate fundamental knowledge useful to the conservation of this species, and likely other native fishes. The methodology is state of the art and innovative, and is designed to integrate early and adult life history with physiological tolerances, and metapopulation genetics. The information gained has a high likelihood of making a fundamental contribution to the knowledge base of this and similar species. All of the studies feed into an objective of implementing and monitoring of restoration projects, which should be of value to decision-makers.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The proposed work is well documented by the previous track record of the principle investigators. Similar work by the principle investigators, while at a smaller scale, indicates that there is high likelihood of success. The project involves intensive laboratory studies with large scale testing at a number of field sites of various environmental and hydrologic regimes. The scale of the project addresses the full extent of the native range of the species, as well as its introduced range. Thus the approach is both intensive and broad and consistent with the objective of reintroduction.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

Performance measures consist of project reports, white papers, talks at scientific meeting, journal publications, and a list of potential reintroduction sites. These are all transparent means to track progress and gain feedback from peer review.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

The proposed research should be of immediate value. The reintroduction of Sacramento perch would raise public awareness for what the proposal calls a charismatic game fish, which might spill over into other ecosystem restoration efforts. The basic biological information gained will likely be of value in the restoration efforts for other native fishes.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

The track record of the principle investigators is extensive. They demonstrate a high level of accomplishment in fields of science that are central to the objectives of the proposed work. The exhibit a past track record that shows an ability to bring integrated research projects to a conclusion, by getting the "paper work" done. In particular, the laboratory facilities used in this work will be of critical importance, and they have a well documented track record.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

Yes.

Miscellaneous comments:

I find the proposed work to be state of the art in its scope. Many restoration efforts tend towards a "Johnny Appleseed" approach. This project, however, seeks to reveal the underlying physiological tolerances, population dynamics and genetic structure of extant populations that are critical to a restoration program. This will enable restoration efforts to be integrated at an ecosystem level, which the proposal intends to implement within adaptive management framework.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
XExcellent	The proposed research on the basic population biology of the Sacramento Perch is important for re-establishing any threatened population. The Sacramento Perch is the only native sunfish in CA and its abundances throughout the Delta have declined sharply over the past decades. The approach presented is sound and thoughtful, and the researchers have an excellent track record. Re-establishment strategies may not emerge from this specific proposal and the population may be influenced by additional environmental stressors that are not specifically addressed in this proposal. The CALFED Restoration Program needs to determine how much emphasis will be placed on the re-establishment of specific populations. If re-establishment of the Sacramento Perch is considered high priority, then the proposed research deserves an EXCELLENT rating.
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

The goals, objectives, and hypotheses are clearly stated and extremely well organized. The authors aim to understanding the population biology and ecology of the Sacramento Perch, the only native sunfish in California. The Sacramento Perch was once abundant in the Delta, but its population has been decimated in recent decades. The authors have a series of

logically connected, step-wise objectives: 1) summarize existing information, 2) document early life history, 3) document physiological tolerance, 4) assess genetic diversity, and 5) propose re-establishment strategies. The Sacramento Perch has been designated as an at risk species by CALFED and is the only native sunfish in CA, hence the proposed work is timely and important.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The study is justified because we have a poor understanding of the basic population biology, physiology, and ecology of this threatened native species. Restoration strategies aimed at sustaining or re-establishing specific native fish populations require such basic information. In the absence of such fundamental population biology information, restoration and management strategies are limited to blind trial and error efforts. The authors present a thoughtful conceptual model and have organized their proposed research around this sound model. This model and organization would be useful for studying a wide array of fish populations.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

The approach is sound, and the authors have an outstanding record of conducting similar research. The methodology and approaches model a long standing tradition in population biology. The information generated on the Sacramento Perch will be novel and provide insight into the stressors that have resulted in the demise of the species in the Delta. The information generated will be of interest to decision makers if the return of the Sacramento Perch and other native fishes continues to be a CALFED priority.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The approach is well documented and likelihood of success is very high. Objectives 1-4 are clearly feasible, but Objective 5 may be beyond the scope of the current proposal.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

The work plan is sound and the authors and their associated research teams have extensive experience in completing similar projects. The research is organized in a logical, step-wise manner.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

Management plans geared at re-establishing critical populations require thorough knowledge about the population biology of individual species. Translation of our understanding of a specific population (in this case, Sacramento Perch) into a re-establishment plan must consider numerous factors unrelated to documentation of the life-history, physiological ecology, and genetic diversity. In this regard, a definitive Delta re-establishment plan is unlikely to emerge

from this present proposal. If return of the Sacramento Perch is highly desired, additional factors such as predation, chemical stressors, resource competition, and others must also be considered.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Excellent track records. Highly qualified research team.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

seems somewhat expensive considering the proposal is limited to one at risk species and additional information would certainly be necessary to devise a rigorous re-establishment program

Miscellaneous comments:

The CALFED Restoration Program will need to determine the relative merits of research aimed at specific threatened populations.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **208**

Applicant Organization: **University of California, Davis**

Proposal Title: **Restoration of Sacramento Perch to San Francisco Estuary**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None.

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	As stated above, this is a technically strong proposal, with solid researchers and appropriate infrastructure. The apparent pursuit of knowledge for its own sake seems to be the problem with this project, especially in light of its large cost (almost half of a million dollars) and the lack of pilot studies to support and justify it.
X Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

There is one stated goal in the proposal: Goal: to develop strategies to restore SP to self-sustaining wild populations in the San Francisco Estuary, and to assure the SP long-term future in Central California.

There are five stated Objectives: Objective 1: summarize existing information on SP, emphasizing factors contributing to survival of introduced populations, collapse of native populations, and persistence of some native populations.

Objective 2: document early life history of SP and the factors contributing to survival of early life history stages.

Objective 3: Document physiological tolerance limits and preferences of juvenile and adult SP, specifically regarding upper and lower temperature limits, upper salinity limits, upper and lower pH limits, lower dissolved oxygen limits, and upper velocity limits.

Objective 4: Document the genetic variation within and among the extant populations of SP by examining variation at microsatellite loci.

Objective 5: Develop re-establishment strategies for SP, including analysis of institutional, physical, and biological barriers to their reintroduction into the San Francisco Estuary and Central Valley.

The goals, objectives and hypotheses are clearly stated, but they lack internal consistency (as stated below). The concept seems timely and important, although this is difficult to evaluate given the minimal justification for the work offered by the authors. Unfortunately, the authors did not demonstrate that the specific team approach they are proposing has been successful elsewhere.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The greatest weakness of this proposal is the poor justification offered for the work. Other than indicating that populations of the Sacramento perch have declined and it is recognized as a "species of concern" and an "At-Risk species" by various agencies, the authors provide no real justification for work in this species. They do not indicate that the species has special ecological significance, for example, nor do they offer any insight as to why this species should be studied instead of others in the same categories. The proposal is generic enough that the name of almost any endangered fish of the region could be substituted for Sacramento perch with minor change to the proposal.

The authors likewise do not justify adequately their choice of research approaches. For example, why study early life history? If this is a constraint to survival of the species in natural environments, then how would the goal of restoring self-sustaining wild populations be achieved? Why document physiological tolerance limits and preferences of juveniles and adults from a single population (Lagoon Valley Reservoir) if the authors expect variation across populations? Why document the genetic variation within and among extant populations without first addressing the possibilities that too little or too much variation could be present or that the fish could have been subject to introgression from hybridization with non-native sunfish species(greatly reducing the need for a full genetic analysis)?

The authors fail to justify why this work is not proposed as a smaller pilot study. There is considerable uncertainty surrounding achievement of the stated recovery goal. A well designed pilot study is necessary to identify what natural habitat is available and the basic genetic structure of populations available for recovery efforts. If the habitat or genetic resources are limiting, why proceed with the life history and physiology work?

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

Apart from the lack of adequate justification, it is not clear how this approach will lead to the goal of developing strategies to restore Sacramento perch to self-sustaining wild populations in the San Francisco Estuary, and to assure the long-term future of the species in Central California. While each investigator in this proposal has impressive credentials for the work outlined in their section, there is only a superficial effort to demonstrate linkage of the activities.

The approach outlined in the proposal brings to mind the parable of the three blind men who each try to describe an elephant by touching a single part of the animal. While each description was accurate, none described the whole, and the conflicting descriptions led to disagreement as to what an elephant looked like. The proposal comes across as saying that each expert will perform basic research specific to their expertise and the three will get together to discuss their findings. This gives the appearance of a lack of insight and focus to the project, and raises questions about the value of the specific approach. Thus, although the work in this proposal is designed to yield copious information, it is uncertain how much of it will be useful information.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The research as described appears technically feasible, although the format of the proposal limits the technical information available for review. There is no reason to doubt that these researchers can perform the specific tasks as outlined in the Objectives. The problem as stated above is the question of how much of this work will be relevant to the actual long-term goal of developing self-sustaining populations.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

It appears that appropriate performance measures are in place for the stated Objectives. However, this project, despite indicating restoration in the title, is in reality a fact-finding mission to assist development of strategies for restoration. Insufficient information is presented to evaluate the project-specific performance measures for achieving the goal of strategy formulation.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

The project is likely to result in much data and numerous publications and scientific presentations. However, the ultimate product of this project is stated as development of restoration strategies based on this information. Unfortunately, given the lack of pilot studies, it is possible that the work could instead demonstrate that there are no realistic restoration strategies available (perhaps due to genetic problems or insufficient suitable habitat).

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

From the information provided, it appears that these researchers have the qualifications, infrastructure and agreements necessary to achieve the stated Objectives. Indeed, it is a strong collection of research firepower.

- 8. Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

As presented, the budget seems appropriate for the work proposed with the exception of the genetics portion. Supplies and expendables of \$26,100 (Year 1) and \$23,900 (Year 2) seem excessive for the work proposed. The \$8,000 requested for "equipment maintenance" should be justified as should the \$2,500 for computing (if a computer needs to be purchased for the project it should be explained why).

The pertinent question is however, is the final product worth the expense? It seems clear that a smaller pilot project should address this species before funding at the requested level. The "White Paper" proposed in Objective 1 combined with some preliminary genetic analysis of different populations would be a great starting place. With favorable findings, a project of the scope outlined in this proposal would be justified, and would benefit from a more targeted approach with regard to elucidating constraints and the development of a restoration program.

Miscellaneous comments:

In all, the proposal is well written and professionally assembled, but it seems a bit uninspired. Although inspiration is not generally considered a requirement of successful proposals, the formulaic presentation in this proposal raised the question of how innovative the work and its application will be.

Prior Performance/Next Phase Funding: #1

New Proposal Number: 208

New Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

1. Prior CALFED project numbers, titles, and programs: *(list only projects for which you are the contract manager)*

ERP 99-N02 - Fish Treadmill Developed Fish Screen Criteria for Native Sacramento- San Joaquin Watershed Fishes ERP 99-N06 Linked Hydrogeomorphic Ecosystem Models to Support Adaptive Management

2. Prior CVPIA project numbers, titles, and programs: *(list only projects for which you are the contract manager)*

N/A

3. Have negotiations about contracts or contract amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

-Yes XNo -N/A

If no, please explain any difficulties:

The Office of Vice Chancellor for Research at UC Davis has requested numerous and repeated requests for revisions of the standard contract terms. Only a few of these issues were raised in the PSP process. Reconciling these issues has required extensive staff time for CALFED and other State agencies. This repeated negotiation has resulted in a delay of contract execution for up to 2 years.

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

XYes -No -N/A

If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

XYes -No -N/A

If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

XYes -No -N/A

If no, please explain deficiencies:

UC Davis has had consistent difficulty communicating internally and externally regarding its fiscal documentation. Reconciling financial issues with UC Davis has proved very problematic. The financial situations raised by UC Davis have proved to be the most difficult within the NFWF managed CALFED contracts.

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

-Yes -No -N/A

If no, please explain:

N/A

Other Comments:

The difficulties expressed above are limited to UC Davis campus only.

The Principal Investigators Joe Cech and Peter Moyle have been very professional and effective in meeting the goals of the project.

Prior Performance/Next Phase Funding: #2

New Proposal Number: 208

New Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

1. Prior CALFED project numbers, titles, and programs: *(list only projects for which you are the contract manager)*

00-F08, McCormack-Williamson Tract II Monitoring Program, CALFED ERP

2. Prior CVPIA project numbers, titles, and programs: *(list only projects for which you are the contract manager)*
3. Have negotiations about contracts or contract amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

XYes -No -N/A

If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

XYes -No -N/A

If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

XYes -No -N/A

If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

XYes -No -N/A

If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

-Yes -No **X**N/A

If no, please explain:

Other Comments:

Applicant has performed well in implementing prior contract.

Environmental Compliance:

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

☒Yes -No

If no, please explain:

Scientific Collecting Permit has been obtained for fish collection. No other permits or environmental documentation are necessary.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

☒Yes -No

If no, please explain:

Permit has been obtained.

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

-Yes ☒No

If yes, please explain:

Other Comments:

Budget:

Proposal Number: 208

Applicant Organization: University of California, Davis

Proposal Title: Restoration of Sacramento Perch to San Francisco Estuary

1. Does the proposal include a detailed budget for each year of requested support?

☒Yes -No

If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

☒Yes -No

If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

☒Yes -No

If no, please explain:

4. Are appropriate project management costs clearly identified?

-Yes ☒No

If no, please explain:

None!

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

-Yes ☒No

If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

Question 17a. = \$424,246, and the Budget Summary = \$439,772.60.

6. Does the budget justification adequately explain major expenses?

☒Yes -No

If no, please explain:

7. Are there other budget issues that warrant consideration?

-Yes ☒No

If yes, please explain:

Other Comments: